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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/538,876

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Roberto Gemello

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EXAMINER

GADDY, BENJAMIN E

ART UNIT

PAPER NUMBER

2626

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,876	<b>Applicant(s)</b> GEMELLO ET AL.	
	<b>Examiner</b> Benjamin E. Gaddy	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-20 and 23-26 is/are rejected.
- 7) ☒ Claim(s) 21 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/14/2005</u> .                                               | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. Claims 21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23 – 26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 23 and 24 are directed towards computer code, which does not fall into a recognized statutory category. Examples of acceptable preambles include: “a computer readable medium encoded with computer executable instructions” or “a computer readable medium having a stored computer program.”

For the purposes of examination, it will be assumed that the applicant intended to claim a computer-readable article of manufacture embodying the claimed code.

In addition, claims 23-26 are rejected under 35 U.S.C. 101 because they are hybrid claims. In this case, 23 and 24 are directed towards a computer program, and 25 and 26 are directed towards a system. Each depends on the limitations in a method claim. This is not statutorily appropriate.

For the purposes of examination, it will be assumed that in the case of 23, 24, and 25, the applicant intended to write independent claims that explicitly included the limitations of a previous claim, and if so written, claim 26 would be appropriate without modification.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 14, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065).

Consider claims 14, 23, and 24 (and the above 101 rejections): Li discloses a method of executing a neural network in a speech processing system for processing speech of an input speech signal organized into a series of frames (**see Col. 4, lines 25-35, where Li discusses a neural network; Col. 3, lines 20-35, where Li discusses a speech processing system using frames**), comprising: evaluating a distance between non-consecutive frames and selectively skipping the run of the neural network in correspondence of at least one frame between said non-consecutive frames; and calculating said distance as a distance between outputs of said neural network (**see Col. 6, line 64 – Col. 7, line 10, where Li discusses evaluating a distance and discarding**).

Li does not specifically disclose likelihoods for recognizing speech, however Eberman discloses likelihoods for recognizing speech (**see Col. 4, lines 16-29, where Eberman discusses distance represents a likelihood, in a speech recognition system**). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, and use likelihoods as taught by Eberman, thus providing a speech processing system where clean speech signals can naturally be represented, as discussed by Eberman (**see Col. 3, lines 61-67**).

4. Claims 15-17 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) as applied to claim 14 above, and further in view of Chen (US 4,379,949).

Consider claims 15 and 25 (and the above 101 rejection): Li and Eberman disclose a) buffering a plurality of input frames (**see Col. 5, lines 49-66, where Li discusses using 5 sequential frames as input, therefore buffering**); b) defining an interval corresponding initially to a main interval of frames delimited by a first and a second non-consecutive buffered frames (**see Col. 6, line 64 – Col. 7, line 10, where Li discusses non-adjacent frames**); c) calculating, by means of said neural network, a first and a second likelihood corresponding to the frames delimiting said interval (**see Col. 4, lines 16-29, where Eberman discusses distance represents a likelihood**); d) calculating a distance between said first and second likelihoods (**see Col. 6, line 64 – Col. 7, line 10, where Li discusses evaluating a distance**); e) comparing said distance with a predetermined threshold value and, in case said distance is lower than said threshold value, calculating the likelihood or likelihoods corresponding to the frame or frames within said interval, or, in case said distance is greater than said threshold value, calculating, by means of said neural network, at least one likelihood corresponding to a frame within said interval (**see**

**Col. 6, lines 60-67, where Li discusses a threshold**); and f) applying recursively said steps c) to e) to each interval present as a sub-interval within said main interval containing at least one frame whose likelihood has not been yet calculated, until all the likelihoods corresponding to the frames in said main interval have been calculated (**see Fig. 3, where Li shows a retraining loop, therefore recursive steps**).

Li and Eberman do not specifically disclose interpolating, however Chen discloses interpolating (**see Col. 5, lines 21-45, where Chen discusses an interpolation between frames**). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li and Eberman, and use interpolating as taught by Chen, thus reducing the bandwidth necessary, as discussed by Chen (**see Col. 3, lines 27-38**).

Consider claim 16: Li, Eberman, and Chen disclose a linear interpolation (**see Col. 5, lines 21-45, where Chen discusses a linear interpolation**).

Consider claim 17: Li, Eberman, and Chen disclose a main interval of frames comprises said plurality of buffered input frames (**see Col. 6, lines 56-67, where Li discusses variable frame encoding**).

5. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 15 above, and further in view of Takahashi (US 6,064,958).

Consider claim 18: Li, Eberman, and Chen disclose likelihoods are probabilities.

Li, Eberman, and Chen do not specifically disclose probability distributions, however Takahashi discloses probability distributions (**see Col. 14, lines 55-65, where Takahashi discusses a**

**distribution**). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use probability distributions as taught by Takahashi, thus providing pattern recognition using probabilistic models, as discussed by Takahashi (**see Col. 4, line 65- Col. 5, line 10**).

Consider claim 19: Li, Eberman, Chen and Takahashi disclose distance between said first and second likelihoods is calculated as a symmetric Kullback distance between probability distributions (**see Col. 14, lines 55-65, where Takahashi discusses Kallback information**).

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 15 above, and further in view of Huang (US 6,801,895).

Consider claim 20: Li, Eberman, and Chen disclose threshold value is a fuzzy set. Li, Eberman, and Chen do not specifically disclose a fuzzy set, however Huang discloses a fuzzy set (**see Col. 6, lines 44-67, where Huang discusses a fuzzy threshold**). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use a fuzzy set as taught by Huang, thus simplifying a process, as discussed by Huang (**see Col. 2, lines 11-17**).

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US 5,689,616) in view of Eberman (US 5,924,065) and Chen (US 4,379,949) as applied to claim 25 above, and further in view of Levine (US 6,118,392).

Consider claim 26 (and the above 101 rejection): Li, Eberman, and Chen disclose a buffer.

Li, Eberman, and Chen do not specifically disclose a lookahead buffer, however Levine discloses a lookahead buffer (**see Col. 13, lines 40-55, where Levine discusses a lookahead buffer**). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Li, Eberman, and Chen, and use a lookahead buffer as taught by Levine, thus providing particularly good compression, as discussed by Levine (**see Col. 1, line 65- Col. 2, line 4**).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin E. Gaddy whose telephone number is (571) 270-5134. The examiner can normally be reached on M-TH 9am - 4pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2626

/Patrick N. Edouard/

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